

FineFocus.org Website Administration: A Customized Content Management System

**An Honors Thesis (HONR 499)**

**by**

Travis Doyle Smith

**Thesis Advisor**

Dr. John L. McKillip

**Ball State University  
Muncie, Indiana**

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## Abstract

As the popularity of the World Wide Web has exploded and impacted everyone's lives, it is important for organizations to have a strong online presence. Unfortunately, very few people actually have the know-how to build these kinds of websites. That is where a content management system comes in to play. By using a content management system, anyone can go in and update a website with very little (if any) knowledge of web programming standards. That was the idea behind *Fine Focus*' completely redesigned website. *Fine Focus*, a microbiology journal for undergraduate research, could significantly benefit from the use of a customized content management system, allowing anyone to bring all site content, regardless of one's experience with web programming, up to date. The goal of this thesis is to create such an application.

## Acknowledgements

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I would also like to thank the entire *Fine Focus* team for their invaluable support, encouragement, and input during this project.

### Author's Statement

The idea for this application came to me one day when Dr. McKillip asked the question, “Who is going to take your place next semester?” I had finished creating the frontend of FineFocus.org and I knew it had to be maintained as future semesters came through. Since *Fine Focus* is part of an honors colloquium course, the students managing the journal (and its website) change with each new semester. I figured that finding people willing to replace me would be difficult. Their tasks would include fixing this or updating that every couple of weeks or so: mind-numbingly boring tasks that a computer science major would not want to do. Sure, someone with that kind of knowledge might come in and do some redesigning, but that certainly will not happen every semester.

Finding a human replacement was, most likely, not feasible. So, I thought, why not give all users the power to maintain the website, not just those who are good at web programming? It would reduce the work a single person would have to complete and empower those who do work with site content. After all, a lot of software exists to help users create and update websites. Thus, the idea of FineFocus.org Website Administration was born. By creating software that could easily help a user perform content updating tasks, it would allow anyone to go in and make any basic changes using a familiar graphic user interface. Also, it would allow those with more technical knowledge to make design and programming changes with ease. After months of coding and testing, I believe FineFocus.org Website Administration meets its goals.

FineFocus.org Website Administration is considered a content management system. A content management system is considered a CRUD application (CRUD stands for Create, Read, Update and Delete). For a content management system to be the most functional, it needs to let the user efficiently perform all of these tasks. The primary purpose of a CRUD application is

allowing visitors to see any necessary content. But beyond that, it needs to provide the ability for managers to create, update, and delete content. Any changes made should be reflected back to the visitor. Because managing content is a privileged task, not everyone should be able to go in and change things however they want. A content management system goes beyond a basic CRUD application to manage who can and cannot update the website. Requiring a user to enter in an authentic user name and password before performing these activities achieves this task.

FineFocus.org Website Administration was coded using a programming technique called object-oriented programming. Object-oriented programming focuses on “objects” in an application and functions that can be performed on those objects, as opposed to a procedural sequence of steps that needs to take place in an application. As an example, take a “Vehicle” object. When this object is created, a developer could create at least two instances of the Vehicle object: Car and Motorcycle. These instances would be defined by specific attributes about each Vehicle (for example, define Car as having 4 wheels, Motorcycle as having 2 wheels, as well as other necessary attributes). All of these different attributes could be called and used in functions, such as drive forward, break, or back up. Without using object-oriented programming, the developer would have to write statement after statement on how to move Car forward, then how to move Motorcycle forward, then how to break Car, and all other necessary actions for all existing vehicles. Object-oriented programming allows developers to take advantage of reusable code and scripts that are easy to read. Using this programming technique should greatly assist those who continue development on FineFocus.org Website Administration.

The software bundle that runs behind FineFocus.org Website administration is the LAMP stack (LAMP stands for Linux, Apache, PHP, and MySQL). The LAMP stack is widely used, mainly because it includes a lot of popular technologies and is free. It is the engine behind many

popular websites, such as Wikipedia, Facebook, and YouTube. Any application (web, desktop, mobile, or otherwise) needs an operating system so it can execute successfully. Linux is the operating system that currently runs the application, although it could run on almost any operating system. Linux was chosen because it is free and contains a lot of technology that FineFocus.org Website Administration needs to be the most functional. All web applications need to run on top of a web server. A web server is responsible for displaying the proper content to a user when he or she navigates to a certain webpage on a website. Apache is the web server for FineFocus.org Website Administration. Apache is free, reliable, well-documented, and very popular to use with a Linux operating system.

Dynamic web applications need a scripting language and a database for CRUD operations. PHP is the scripting language for FineFocus.org and MySQL is the database. These technologies are popular because, again, they are free and very well documented, as they are widely used in the technology world. A scripting language automates the execution of a task. A database has the power to store, access, and change information as the user requests. Together, they can be used to assist users with content management. Specifically, the scripting language acts as the middleman between the user and the database, providing the user with a straightforward interface to manage database content.

With the creation of FineFocus.org Website Administration, *Fine Focus* will significantly benefit from a contemporary web presence. Effectively using this application will allow anyone to perform necessary tasks without needing web programming experience. Every effort has been made to ensure that this customized content management system just works the way it is supposed to work. Many students will find FineFocus.org Website Administration to be an invaluable piece of useful software for years to come.

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